

**WHAT IS CLAIMED IS:**

1. An apparatus for printing a visual image on a surface of a food item, the apparatus comprising:
  - a computer;
  - software executing on the computer for selectively creating a unique prototype of the food item;
  - software executing on the computer for scanning an image to be printed;
  - software executing on the computer for adjusting the image on the uniquely created prototype, so as to enable an operator to view an image of the food item with the image printed thereon; and
  - a printing station provided with a printer connected to the computer and having software for directly printing the image on the exposed surface of the food item.
2. The apparatus according to claim 1, wherein the printing station includes a frame, a plurality of spaced rollers mounted on the machine frame and rotatable about parallel roller axes;
  - at least one tray receiving the food item to be printed upon and supported by the at least one roller;
  - a printer head operating to reciprocally move in a direction parallel to the roller axis and to apply edible ink to the exposed surface of the food item; and
  - a guide mechanism operative to linearly displace the at least one tray in a direction perpendicular to the roller axis so that a distance between the printer head and the exposed surface of the food item remains uniform as the tray is displaced along the travel direction.
3. The machine according to Claim 2, wherein the guide mechanism includes a motor provided with a motor shaft and operative to rotate the motor shaft about a motor axis parallel and to the roller axis.

4. The machine according to Claim 3, wherein the motor is mounted on the machine frame, the guide mechanism further including two gears spaced axially apart and two spaced racks provided on opposite sides of the at least one tray and engaging the one and other gears, respectfully, so that a rotational movement of the motor shaft is converted into linear displacement of the at least one tray.

5. The machine according to Claim 3, wherein the guide mechanism includes a single gear mounted on the motor shaft midway between opposite sides of the at least one tray and a rack shaft provided on a bottom of the at least one tray to engage the single gear for converting the rotational movements of the motor shaft into the linear displacement of the at least one tray.

6. The machine according to Claim 5, wherein the guide mechanism further includes spaced apart flanges extending between the single gear and the rack shaft to prevent mutual axial displacement thereof.

7. The machine according to Claim 2, wherein the at least one tray is shaped and dimensioned to receive a variety of cassettes carrying food products, each of the cassette being dimensioned so that regardless of a thickness of a respective food product a distance between the printer head and the exposed surface of the products remains constant.

8. A machine for printing images on foodstuffs comprising:  
a frame;  
at least one support roller mounted on the machine frame and rotatable about a roller axis;  
at least one tray receiving the foodstuff to be printed upon and supported by the at least one roller;  
a printer head movable reciprocally in a direction parallel to the roller axis to apply edible ink to the surface of the food items; and  
a guide mechanism operative to linearly displace the at least one tray in a direction

transverse to the roller axis so that so that a distance between the printer head and the exposed surface of the food item remains uniform as the tray is displaced along the travel direction.

9. The machine defined in Claim 8, wherein the guide mechanism includes a motor provided with a motor shaft and operative to rotate the motor shaft about a motor axis parallel and to the roller axis.

10. The machine defined in Claim 9, wherein the motor is mounted on the machine frame, the guide mechanism further including first and second gears spaced axially apart and first and second racks provided on opposite sides of the at least one tray and engaging the first and second gears, respectfully so that a rotational movement of the motor shaft is converted into the linear displacement of the at least one tray.

11. The machine defined in Claim 9, wherein the guide mechanism includes a single gear mounted on the motor shaft midway between opposite sides of the at least 1 tray and a rack shaft provided on a bottom of the at least one tray to engage the single gear for converting the rotational movements of the motor shaft into the linear displacement of the at least one tray.

12. The mechanism defined in Claim 11, where the guide mechanism further includes a two spaced apart flanges extended between the single gear and the rack shaft to prevent mutual axial displacement thereof.

13. A method of printing a visual image on a generally surface of a food item, the process comprising the steps of:

electronically creating a unique template of the food item having a specific shape and size;

scanning a visual image to be printed upon the food item and adjusting the image to the

template; and

linearly displacing at least one tray in a travel direction to maintain a uniform distance between a printer head and the exposed surface of the food item as the tray is displaced along the travel direction while directly printing the image on a hardened surface of the at least one food item.

14. A jet-printing apparatus for printing colored images upon a generally surface of a food item comprising:

a print driver;

a guide mechanism operative to linearly displace at least one tray carrying the food item in a travel direction; and

a controller for operating the printing apparatus in an automatic mode, wherein the print driver is controlled with an automatic calibration color profile to correctly print the colors by mixing the jetted ink on the surface of the food item, and in a semi-automatic mode, wherein the print driver is controlled with a modified calibration color profile to adjust the colors in accordance with individual preferences of an operator before printing images on the surface, the guide mechanism being controlled by the controller so that a distance between a printer head and the exposed surface of the food item remains uniform as the at least one tray is displaced along the travel direction.

15. The jet-printing apparatus defined in claim 14, further comprising a displaceable cartridge carrier and a plurality of cartridges filled with differently colored edible inks on said cartridge, a source of light, and a photo-sensor for generating a signal representing measured frequency spectral characteristics of each color printed on a testing sheet upon turning the light source on, and a comparator for comparing the generated signal for each of the colors and a respective reference value to modify the jetted ink in response to a correcting signal generated upon the comparison.

16. The jet-printing apparatus defined in claim 14, further comprising:

software executed on the controller for identifying the authenticity of each of the cartridges and components within the computer to prevent the jet-printing apparatus from printing the images if at least one of the cartridges and the components has been tampered with.

17. The jet-printing apparatus according to claim 16, further comprising:
  - software executed on the controller for selecting a shape of the food item selected from the group consisting of a polygonal, heart, oval and round shape and a combination of these shapes;
  - software executing on the controller for selecting a text to be printed upon the surface of the food item;
  - software executed on the controller for scanning an image to be printed;
  - software executed on the controller for automatically adjusting the image on the selected food-item;
  - software executing on the controller for automatically calibrating color profile to correctly print the colors by mixing the jetted edible ink on the surface of the food item;
  - software executing on the controller for identifying the authenticity of the edible ink; and
  - software executing on the controller for controllably displacing the photo-sensor over the testing sheet.

18. A jet-printing apparatus for printing colored images upon a surface of a food item comprising:
  - a guide mechanism operative to linearly displace at least one tray carrying the food item in a travel direction;
  - a cartridge carrier displaceable over the food item in a direction perpendicular to the travel direction;
  - a plurality of cartridges displaceable with the cartridge carrier, each of the cartridges being filled with a respective differently-colored edible ink, each of the cartridges being provided with a respective first storage device storing a code uniquely identifying the manufacturing authenticity of the;

a computer; and

software executed on the computer for identifying the authenticity of each of the cartridges and components within the computer to prevent the jet-printing apparatus from printing the images if at least one of the cartridges and the components has been tampered with.

19. The jet-printing apparatus according to claim 18, further comprising:

software executed on the computer for selecting a shape of the food item selected from the group consisting of a polygonal, heart, oval, and round shape and a combination of these shapes

software executed on the computer for scanning an image to be printed;

software executed on the computer for automatically adjusting the image on the selected food-item;

software executing on the computer for automatically calibrating color profile to correctly print the colors by mixing the jetted edible ink on the surface on the food item, and

software executing on the computer for identifying the authenticity of the edible ink.

20. The jet-printing apparatus according to claim 19, further comprising a database for storing a plurality of the shapes of the food item, and a database for storing a variety of texts.